

## WEST Search History

DATE: Friday, March 21, 2003

<u>Set Name</u> side by side	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u> result set
	<i>DB=USPT; PLUR=YES; OP=ADJ</i>		
L13	cobra and broker and L10	0	L13
L12	asn1 and broker and L10	0	L12
L11	broker and L10	21	L11
L10	translat\$4 and L9	22	L10
L9	convert\$4 and L8	24	L9
L8	idl and l5	24	L8
L7	network and L6	1	L7
L6	cobra and L5	1	L6
L5	l3 and L4	135	L5
L4	convert\$4 same type	132936	L4
L3	metadata and l1	668	L3
L2	metadata adj2 gateway	0	L2
L1	client and server	15474	L1

END OF SEARCH HISTORY

## WEST Search History

DATE: Friday, March 21, 2003

<u>Set Name</u> side by side	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u> result set
<i>DB=USPT; PLUR=YES; OP=ADJ</i>			
L11	broker and L10	21	L11
L10	translat\$4 and L9	22	L10
L9	convert\$4 and L8	24	L9
L8	idl and l5	24	L8
L7	network and L6	1	L7
L6	cobra and L5	1	L6
L5	l3 and L4	135	L5
L4	convert\$4 same type	132936	L4
L3	metadata and l1	668	L3
L2	metadata adj2 gateway	0	L2
L1	client and server	15474	L1

END OF SEARCH HISTORY

**WEST**[Generate Collection](#)[Print](#)**Search Results - Record(s) 1 through 21 of 21 returned.**☐ 1. Document ID: US 6529948 B1

L11: Entry 1 of 21

File: USPT

Mar 4, 2003

US-PAT-NO: 6529948

DOCUMENT-IDENTIFIER: US 6529948 B1

TITLE: Multi-object fetch component

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc
Image												

☐ 2. Document ID: US 6529909 B1

L11: Entry 2 of 21

File: USPT

Mar 4, 2003

US-PAT-NO: 6529909

DOCUMENT-IDENTIFIER: US 6529909 B1

TITLE: Method for translating an object attribute converter in an information services patterns environment

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc
Image												

☐ 3. Document ID: US 6523027 B1

L11: Entry 3 of 21

File: USPT

Feb 18, 2003

US-PAT-NO: 6523027

DOCUMENT-IDENTIFIER: US 6523027 B1

TITLE: Interfacing servers in a Java based e-commerce architecture

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc
Image												

☐ 4. Document ID: US 6505228 B1

L11: Entry 4 of 21

File: USPT

Jan 7, 2003

US-PAT-NO: 6505228

DOCUMENT-IDENTIFIER: US 6505228 B1

TITLE: Dynamic determination of execution sequence

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KVMC	Draw Desc
Image												

☐ 5. Document ID: US 6502213 B1

L11: Entry 5 of 21

File: USPT

Dec 31, 2002

US-PAT-NO: 6502213

DOCUMENT-IDENTIFIER: US 6502213 B1

TITLE: System, method, and article of manufacture for a polymorphic exception handler in environment services patterns

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KVMC	Draw Desc
Image												

☐ 6. Document ID: US 6496850 B1

L11: Entry 6 of 21

File: USPT

Dec 17, 2002

US-PAT-NO: 6496850

DOCUMENT-IDENTIFIER: US 6496850 B1

TITLE: Clean-up of orphaned server contexts

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KVMC	Draw Desc
Image												

☐ 7. Document ID: US 6496833 B1

L11: Entry 7 of 21

File: USPT

Dec 17, 2002

US-PAT-NO: 6496833

DOCUMENT-IDENTIFIER: US 6496833 B1

TITLE: System and method for generating code for query object interfacing

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KVMC	Draw Desc
Image												

☐ 8. Document ID: US 6477665 B1

L11: Entry 8 of 21

File: USPT

Nov 5, 2002

US-PAT-NO: 6477665

DOCUMENT-IDENTIFIER: US 6477665 B1

TITLE: System, method, and article of manufacture for environment services patterns in a netcentric environment

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Image									

KWIC	Draw Desc
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☐ 9. Document ID: US 6477580 B1

L11: Entry 9 of 21

File: USPT

Nov 5, 2002

US-PAT-NO: 6477580

DOCUMENT-IDENTIFIER: US 6477580 B1

TITLE: Self-described stream in a communication services patterns environment

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Image									

KWIC	Draw Desc
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☐ 10. Document ID: US 6442748 B1

L11: Entry 10 of 21

File: USPT

Aug 27, 2002

US-PAT-NO: 6442748

DOCUMENT-IDENTIFIER: US 6442748 B1

TITLE: System, method and article of manufacture for a persistent state and persistent object separator in an information services patterns environment

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Image									

KWIC	Draw Desc
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☐ 11. Document ID: US 6438594 B1

L11: Entry 11 of 21

File: USPT

Aug 20, 2002

US-PAT-NO: 6438594

DOCUMENT-IDENTIFIER: US 6438594 B1

TITLE: Delivering service to a client via a locally addressable interface

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Image									

KWIC	Draw Desc
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☐ 12. Document ID: US 6434628 B1

L11: Entry 12 of 21

File: USPT

Aug 13, 2002

US-PAT-NO: 6434628

DOCUMENT-IDENTIFIER: US 6434628 B1

TITLE: Common interface for handling exception interface name with additional prefix and suffix for handling exceptions in environment services patterns

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KVMC	Draw Desc
Image											

☐ 13. Document ID: US 6434568 B1

L11: Entry 13 of 21

File: USPT

Aug 13, 2002

US-PAT-NO: 6434568

DOCUMENT-IDENTIFIER: US 6434568 B1

TITLE: Information services patterns in a netcentric environment

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KVMC	Draw Desc
Image											

☐ 14. Document ID: US 6347342 B1

L11: Entry 14 of 21

File: USPT

Feb 12, 2002

US-PAT-NO: 6347342

DOCUMENT-IDENTIFIER: US 6347342 B1

TITLE: Method and apparatus for dynamically brokering object messages among object models

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KVMC	Draw Desc
Image											

☐ 15. Document ID: US 6339832 B1

L11: Entry 15 of 21

File: USPT

Jan 15, 2002

US-PAT-NO: 6339832

DOCUMENT-IDENTIFIER: US 6339832 B1

TITLE: Exception response table in environment services patterns

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KVMC	Draw Desc
Image											

☐ 16. Document ID: US 6332163 B1

L11: Entry 16 of 21

File: USPT

Dec 18, 2001

US-PAT-NO: 6332163

DOCUMENT-IDENTIFIER: US 6332163 B1

TITLE: Method for providing communication services over a computer network system

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KVMC	Draw Desc
Image											

☐ 17. Document ID: US 6289382 B1

L11: Entry 17 of 21

File: USPT

Sep 11, 2001

US-PAT-NO: 6289382

DOCUMENT-IDENTIFIER: US 6289382 B1

TITLE: System, method and article of manufacture for a globally addressable interface in a communication services patterns environment

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC	Draw Desc
Image											

☐ 18. Document ID: US 6226788 B1

L11: Entry 18 of 21

File: USPT

May 1, 2001

US-PAT-NO: 6226788

DOCUMENT-IDENTIFIER: US 6226788 B1

TITLE: Extensible network management system

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC	Draw Desc
Image											

☐ 19. Document ID: US 6205465 B1

L11: Entry 19 of 21

File: USPT

Mar 20, 2001

US-PAT-NO: 6205465

DOCUMENT-IDENTIFIER: US 6205465 B1

TITLE: Component extensible parallel execution of multiple threads assembled from program components specified with partial inter-component sequence information

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC	Draw Desc
Image											

☐ 20. Document ID: US 5987633 A

L11: Entry 20 of 21

File: USPT

Nov 16, 1999

US-PAT-NO: 5987633

DOCUMENT-IDENTIFIER: US 5987633 A

TITLE: System, method and article of manufacture for time point validation

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC	Draw Desc
Image											

☐ 21. Document ID: US 5978940 A

L11: Entry 21 of 21

File: USPT

Nov 2, 1999

US-PAT-NO: 5978940

DOCUMENT-IDENTIFIER: US 5978940 A

TITLE: System method and article of manufacture for test operations

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Image									

KMC	Draw Desc
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[Generate Collection](#)[Print](#)

Term	Documents
BROKER.USPT.	1885
BROKERS.USPT.	725
(BROKER AND 10).USPT.	21
(BROKER AND L10).USPT.	21

**Display Format:** [Change Format](#)[Previous Page](#)[Next Page](#)



# WEST Search History

DATE: Friday, March 21, 2003

<u>Set Name</u>	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u>
side by side			result set
<i>DB=USPT; PLUR=YES; OP=ADJ</i>			
L17	L16 and iiop	0	L17
L16	L14 and network and internet	10	L16
L15	L14 and cobra	0	L15
L14	asn1	47	L14
L13	cobra and broker and L10	0	L13
L12	asn1 and broker and L10	0	L12
L11	broker and L10	21	L11
L10	translat\$4 and L9	22	L10
L9	convert\$4 and L8	24	L9
L8	idl and l5	24	L8
L7	network and L6	1	L7
L6	cobra and L5	1	L6
L5	l3 and L4	135	L5
L4	convert\$4 same type	132936	L4
L3	metadata and l1	668	L3
L2	metadata adj2 gateway	0	L2
L1	client and server	15474	L1

END OF SEARCH HISTORY

**WEST**[Generate Collection](#)[Print](#)**Search Results - Record(s) 1 through 10 of 10 returned.**☐ 1. Document ID: US 6466974 B1

L16: Entry 1 of 10

File: USPT

Oct 15, 2002

US-PAT-NO: 6466974

DOCUMENT-IDENTIFIER: US 6466974 B1

TITLE: Environment for creating and managing network management software objects

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC	Draw Desc
Image											

☐ 2. Document ID: US 6457048 B2

L16: Entry 2 of 10

File: USPT

Sep 24, 2002

US-PAT-NO: 6457048

DOCUMENT-IDENTIFIER: US 6457048 B2

TITLE: System for representing device topology in a computer network operable independent of network management software

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC	Draw Desc
Image											

☐ 3. Document ID: US 6427153 B2

L16: Entry 3 of 10

File: USPT

Jul 30, 2002

US-PAT-NO: 6427153

DOCUMENT-IDENTIFIER: US 6427153 B2

TITLE: System and method for implementing Java-based software network management objects

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC	Draw Desc
Image											

☐ 4. Document ID: US 6330562 B1

L16: Entry 4 of 10

File: USPT

Dec 11, 2001

US-PAT-NO: 6330562

DOCUMENT-IDENTIFIER: US 6330562 B1

TITLE: System and method for managing security objects

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Image									

KVMC	Draw Desc
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☐ 5. Document ID: US 6301624 B1

L16: Entry 5 of 10

File: USPT

Oct 9, 2001

US-PAT-NO: 6301624

DOCUMENT-IDENTIFIER: US 6301624 B1

TITLE: Methods systems and software for alleviating event overload conditions for computer networks

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Image									

KVMC	Draw Desc
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☐ 6. Document ID: US 6292909 B1

L16: Entry 6 of 10

File: USPT

Sep 18, 2001

US-PAT-NO: 6292909

DOCUMENT-IDENTIFIER: US 6292909 B1

TITLE: Apparatus for testing communication equipment

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Image									

KVMC	Draw Desc
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☐ 7. Document ID: US 6253243 B1

L16: Entry 7 of 10

File: USPT

Jun 26, 2001

US-PAT-NO: 6253243

DOCUMENT-IDENTIFIER: US 6253243 B1

TITLE: Automated trap control for a distributed network management system

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Image									

KVMC	Draw Desc
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☐ 8. Document ID: US 6243746 B1

L16: Entry 8 of 10

File: USPT

Jun 5, 2001

US-PAT-NO: 6243746

DOCUMENT-IDENTIFIER: US 6243746 B1

TITLE: Method and implementation for using computer network topology objects

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Image									

KMIC	Draw Desc
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☐ 9. Document ID: US 6226679 B1

L16: Entry 9 of 10

File: USPT

May 1, 2001

US-PAT-NO: 6226679

DOCUMENT-IDENTIFIER: US 6226679 B1

TITLE: Common management information protocol (CMIP) agent registration methods  
systems and computer program products

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Image									

KMIC	Draw Desc
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☐ 10. Document ID: US 5848243 A

L16: Entry 10 of 10

File: USPT

Dec 8, 1998

US-PAT-NO: 5848243

DOCUMENT-IDENTIFIER: US 5848243 A

TITLE: Network topology management system through a database of managed network  
resources including logical topologies

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Image									

KMIC	Draw Desc
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[Generate Collection](#)[Print](#)

Term	Documents
NETWORK.USPT.	235067
NETWORKS.USPT.	89108
INTERNET.USPT.	30422
INTERNETS.USPT.	293
(14 AND INTERNET AND NETWORK).USPT.	10
(L14 AND NETWORK AND INTERNET).USPT.	10

**Display Format:** [TI](#) [Change Format](#)[Previous Page](#)[Next Page](#)

**WEST****End of Result Set**

Generate Collection

Print

L16: Entry 10 of 10

File: USPT

Dec 8, 1998

DOCUMENT-IDENTIFIER: US 5848243 A

TITLE: Network topology management system through a database of managed network resources including logical topologiesAbstract Text (1):

A system and method for maintaining complex relationships between computer network elements. The system provides a common database for storing node, type, and view data. The views are created and maintained by the network management system. When a new node is added or parentage of a node is changed, the views of a node are modified in a network database.

Brief Summary Text (4):

The present invention relates to the field of computer systems and their management and control. More specifically, in one particular embodiment the invention provides a method and device for managing and visualizing the topology of a computer network.

Brief Summary Text (5):

As computer networks have developed and achieved wide acceptance, it has become necessary for managers of such networks to have access to software and hardware tools necessary to manage, monitor, and control networks. As networks have increased in complexity, so have the tools needed for their management. Existing management packages for managing a network provide a wide range of functionality including network management application launchers, event request and filtering mechanisms, logging systems for storing network event and performance statistics, alarm correlation mechanisms, load balancing mechanisms, and other tools. Among the most advanced of such packages is SunSoft's Solstice Enterprise Manager 1.1. Other systems include Hewlett Packard's OpenView platform Network Node Manager, Operations Center and AdminCenter; IBM's NetView, and others.

Brief Summary Text (6):

The most advanced of such packages allow multiple operators to access management information simultaneously, and support multiple computing environments. To facilitate this complex functionality advanced network management systems have used an object oriented network model. Network resources represented as objects are stored and manipulated by management applications and agents. The use of such object oriented approaches enables, inter alia, much easier scalability and other advantages. In addition, the support of multiple network management protocols is facilitated. In SunSoft's Solstice products for example, the management tools may be distributed over multiple workstations. The same information is made available to all applications and tools via MISs ("Management Information Servers").

Brief Summary Text (7):

Such systems have met with substantial success and are, in fact, considered to be pioneering in the industry. However, certain challenges remain. For example, while the object oriented approach to network database management has proven successful certain limitations remain. Such systems have, previously, maintained separate databases representing the logical and physical layouts of a network, respectively. Separate applications in the network management system then access and may modify the logical and physical topology databases. In some instances it has been found that two views of the same network can be found to be inconsistent as a result of this architecture.

Brief Summary Text (8):

From the above it is seen that an improved set of tools for maintaining data relating to the physical and logical topology of a network is needed.

Brief Summary Text (10):

Improved tools for maintaining, viewing, and managing the physical and logical topology of a network are provided by virtue of the present invention. The system maintains databases for both logical and physical topology using an improved data model. Consistency is maintained by placing a consistency application in a logical/physical database. Users are able to access the data only through the physical topology database. Both physical and logical topology resides in MIS database.

Brief Summary Text (11):

Accordingly, in one embodiment the invention provides a computer network comprising a plurality of network nodes and interconnections; a network management system comprising a database of managed network resources, the database of managed network resources defining network nodes, associated node types, and associated views of the nodes; and a plurality of network management users, the network management users displaying views of the network using said network management database. Through user modification of node attributes, the views of the network are updated by the system through use of an object oriented database. In a preferred embodiment the views of the network are modified based on input or change of the attributes of the nodes. For example, parent relationships may be used to define a new view node when a new parent is added to an attribute of a node.

Drawing Description Text (2):

FIG. 1 is an overall view of a hypothetical network, showing the relationship to the network management tools described herein;

Detailed Description Text (2):

FIG. 1 illustrates a computer network along with its associated network management system. As shown, the computer network 100 will include hardware such as hosts 101a, 101b, 101c, 101d, and 101e, router 103, and subnetworks 100a and 100b. Hosts 101 may be, for example, users, servers, and other network elements. Attached to one or more of the hosts are network management elements 109. Management elements 109 will be connected to one or more of the network hosts for network managers to monitor and control the network.

Detailed Description Text (3):

The layout of the network is illustrated with regard to physical connectivity, but another set of relationships will also exist. That is, the various elements of the network will also be related by logical relationships. For example, a portion of the users connected to servers 101a and 101b may be in one logical group, while other portions of the network will be in other logical groups. Often it is desirable for network managers to be able to view the network in logical views rather than the physical layout of the network. The present invention provides an improved viewer for looking at and analyzing various portions of the network.

Detailed Description Text (4):

A management system or "nerve center" 111 is provided in the network to manage and control the network. While the management system 111 is illustrated as a single entity on the network, it may in many embodiments be distributed over multiple workstations and servers.

Detailed Description Text (5):

The management system includes an MIS or Management Information Server 113. The MIS is an object oriented network model that enables object definitions to be stored and manipulated by management applications 115, using object oriented tools such as classing, inheritance and scoping to represent complex resources and simplify complex operations. Management applications 115 interact through the network MIS rather than with each other.

Detailed Description Text (7):

As shown in FIG. 1, a particular user of the system will have applications 115 resident on his/her particular server or workstation. In addition, the user may have

various tools, a particular graphical user interface 123, and viewer 125. The various applications utilize the resources of the nerve center to perform management tasks. A database 127 in the nerve center provides a single source of network objects in an object oriented relational database to service the various network applications for management of the network. The system illustrated in FIG. 1 will, in a preferred embodiment, be based on the Solstice Enterprise Manager 1.1, available from Sun Microsystems, Inc. The various software and data elements discussed herein are stored on a memory device 128 such as one or more magnetic or optical disc drives.

Detailed Description Text (8):

FIG. 2 illustrates a typical screen display available to a user of the network management system disclosed herein. As shown, the system will display a viewer 201 in which the topology of the system (logical or physical) may be displayed. In addition, the system may display other items of interest such as an alarm report 203.

Detailed Description Text (9):

Both the logical and physical elements of the network model are stored in a common database 127 according to the invention herein. FIG. 3 illustrates the architecture of the network database 127 according to a preferred embodiment of the invention. The purpose of the topology database is to store topological information about the managed networked environments. Topological information is in the form of objects which represent topological nodes, views, viewnodes, and types. The topology database includes data of the following types: a topoTypeDB, a topoNodeDB, and a topoViewDB. These data are used by the system applications to manage the user's networks.

Detailed Description Text (14):

The topoNodeDB object class 305 contains a flat layout of the objects in the particular managed networked environment, that is, lists of all nodes 307 in the network and their attributes.

Detailed Description Text (16):

TopoNode is an object class that is named under the topoNodeDB object class. The topoNode object class has the following features. TopoNode can be positioned in multiple views. This attribute is allowed since the behavior of "topoTypeLegalChildren" is checked for all parents specified by the attribute. The ASN1 syntax of topoNodeParents is a set of topoNodeId's. Special secondary index queries can be done with actions. TopoNode objects can be renamed. The topoNodeName attribute is unique across all topoNodes under the same topoNode DB. The reason that topoNodeName is not used as the naming attribute is to allow renaming of topoNode objects. If a topoNode object is renamed, it's new name cannot be the same as the name of an existing node.

Detailed Description Text (21):

The topoViewDB 309 object class contains views of the objects in the managed networked environment, that is, of all views 311. The various views contain logical groups of network resources or topology nodes that a user may wish to use for management purposes. For example, a view of various ethernet servers in a network may be desired to monitor the failure rate of such servers. Thus, a view of such servers will be formed.

Detailed Description Text (22):

TopoViewDB is a managed object class that acts as the container for all topoview objects. TopoViewDB lists all views; each of these views are called a topoview. The topoViewDB object class is named under the system object and only one instance of the topoViewDB object class can be created under a system. A view is a graphical representation of a set of related managed objects. For example, in a network that contains multiple subnetworks, the network might be one view that has subnetwork elements and each subnetwork within it might constitute or use separate views.

Detailed Description Text (31):

FIGS. 4A to 4C illustrate various views of a network using the system herein. FIG. 4A illustrates a view of several routers 401 in a network. FIG. 4B illustrates a new view that has been created including only two of the routers that a particular user desires to monitor. FIG. 4C illustrates the display after using the system to add another router to the view. Of course, the layout of networks is most often quite complex and

FIGS. 4A-4C shows only a simple illustration.

Detailed Description Text (36):

FIGS. 6A to 6C illustrate typical use of the present invention. A user typically identifies objects such as routers, hubs, bridges, print servers, NFS servers, and WAN links that have an impact on the greatest number of users on the network. The typical user will then monitor only those devices, reducing the number of managed objects to create and monitor.

Detailed Description Text (37):

In the system herein a view of the network can include part (or all) of a network topology or it can simply be an arbitrary collection of managed objects, not part of the topology. In a small scale network, one might wish to place all the critical nodes into a single view of the network, as shown in FIG. 6A. In this example, a network includes two subnets (A and B), which are connected by a router.

Detailed Description Text (38):

For most network configurations it will be useful to have multiple views of the network to represent functional groupings of network devices and to represent the network topology. Using the database model discussed above, one might want, for example, to depict devices in particular buildings, or a view that consists only of routers. Taking the example in FIG. 6A one might want to create a separate view for each subnet as well as separate views by type of device (routers, NFS servers, and print servers). A user would create these views one element at a time using a graphical user interface, which would then build the database elements discussed above. As an example, views grouping elements by function (software servers, routers, and print servers) and subnetwork(s) might be formed as shown in FIG. 6B. A high level view is shown in FIG. 6C. As shown therein, cloud icons represent the separate views that have been created. By double clicking on the clouds, one would then see the elements within these views of the network. of course, the same element may appear in multiple views. For example, a particular server could occur in both a "servers" view as well as the Net.sub.-- B view, which shows all of the nodes in that subnetwork.

Detailed Description Paragraph Table (1):

TABLE 1	Topology Type Description
Universe	A generic view representation.
Internet	Any combination of IP networks.
Subnetwork	Containers specific to the Internet.
Host	An IP device on a network.
Device	A generic representation of a <u>network</u> element.
Link	A physical connection between two <u>network</u> elements.
Router, Bridge, Hub	Multiple interface devices capable of transferring packets between <u>networks</u> .

CLAIMS:

1. A computer network comprising:

a plurality of network nodes and interconnections;

a network management system that manages physical and logical topologies of said plurality of network nodes and interconnections, said network management system comprising a user modifiable database of managed network resources, said database of managed network resources comprising data indicative of physical and logical topologies, attributes for said plurality of network nodes, associated node types, and a plurality of views associated with said nodes, said plurality of views customized by said network management system based on user input changes in said attributes of said nodes; and

at least one network management user, said at least one network management user displaying said plurality of views of said network using said database of managed network resources.

2. The computer network as recited in claim 1 wherein said attributes of said nodes comprise parent relationships, and wherein a new view node is formed each time a new parent is added to an attribute of a node.



3. The computer network as recited in claim 2 wherein a view node is deleted each time a parent is deleted from attributes of a node.
4. The computer network as recited in claim 1 wherein the at least one network management user access the database of managed network resources through physical topology database.
5. The computer network as recited in claim 1 further comprising a network viewer on a plurality of user workstations, said user workstations forming views of said network based on said database of managed network resources.
6. The computer network as recited in claim 1 wherein said network nodes are defined by a node database object class, said node database object class containing node objects, a type database object class, said type object class containing network object types, and a view database object class, said view database object class containing view objects of said network.
7. The computer network as recited in claim 6 wherein each of said nodes is associated with a severity, wherein alarms posted for a particular node are propagated to selective views of said network.
8. The computer network as recited in claim 1 wherein at least one view of said network are updated by said network management system when a new node is added to said system.
9. The computer network as recited in claim 1 wherein the plurality of views of said network comprise logical groups of nodes which the at least one network management user manages.
10. The computer network as recited in claim 1 wherein the plurality of views of said network are each graphical representation of a collection of managed objects.
11. The computer network as recited in claim 1 wherein the network management system maintains integrity of the database of managed network resources by modifying the attributes for the plurality of network nodes upon addition and deletion of new nodes.
12. A method of managing a computer network comprising:  
  
forming an object oriented database of managed network resources, said database of managed network resources comprising data indicative of physical and logical topologies, network nodes, associated node types, and associated views of said nodes;  
  
managing said computer network by allowing user modifications of said database of managed network resources;  
  
displaying at least one view of said network using said database of managed network resources; and  
  
modifying said at least one view based on said user modifications of said nodes in said database of managed network resources.
15. The method as recited in claim 12 wherein said step of forming an object oriented database of managed network resources comprises the steps of:  
  
forming a node database type class containing a plurality of node type objects;  
  
forming a node type database class containing a topography of nodes in said network; and  
  
forming a view type database class containing views of objects in said network.
16. The method as recited in claim 12 further comprising the step of defining an alarm severity for at least one node in said database, said alarm severity defining when

alarms are propagated to other nodes in a view of said network.

17. Software on one or more storage media, for managing network nodes and interconnections of a computer network, said software comprising:

a database of managed network resources, said database of managed network resources comprising data indicative of physical and logical topologies, network nodes, network node types, and views of said nodes; and

a network administration program, said network administration program managing said network by allowing user modifications of said database of managed network resources, said network administration program modifying said views of said nodes based on user input of changes in attributes of said nodes.

18. The software as recited in claim 17 further comprising a network viewing program, said network viewing program displaying various views of said network based on user selection input.

19. The software as recited in claim 17 further comprising an alarm propagation system, said alarm propagation system propagating alarms in views of said network based on propagation severities associated with said nodes.